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Mountain Poštak, a new hotspot for the Lepidoptera of Croatia (Lepidoptera: Rhopalocera)

T. Koren, M. Črne, G. Pavliha & D. Trkov

Abstract

Between the years 2010 and 2013 we took several field trips to the previously unsurveyed, and little known Mountain Poštak, located close to the crossing points of two major regions, Lika and Dalmatia, Croatia. We visited 11 localities, ranging from the bottom to the top of the mountain (600-1425 m a.s.l.) and recorded 108 butterflies species, which represent 55% of all known butterfly species in Croatia. Regarding the species composition, Mountain Poštak is most similar to the closest surveyed mountain, Mountain Dinara. 16 recorded species are listed in the Croatian Red List of Butterflies, while 10 are listed in the European Red List of Butterflies. Interesting species records include *Parnasius apollo*, *Aricia anteros*, *Aricia eumedon*, *Cupido osiris*, *Coenonympha rhodopensis* and several others. Such a high number of species, along with strong populations of several rare species lists Mt. Poštak as one of the hotspots of butterfly diversity in Croatia.
KEY WORDS: Lepidoptera, Rhopalocera, faunistics, species composition, distribution, mountain, Croatia.

Montaña Poštak, una nueva zona caliente para la diversidad de Lepidoptera de Croacia (Lepidoptera: Rhopalocera)

Resumen

Entre los años 2010 y 2013 realizamos varias excursiones de estudio a la previamente poco explorada y poco conocida montaña Poštak, localizada en el cruce de dos regiones muy importantes, Lika y Dalmacia, Croacia. Visitamos 11 localidades, situadas desde la parte inferior hasta la zona más alta de la montaña (600-1425 m a.s.l.) y registramos 108 especies de mariposas, las cuales representan el 55% de todas las especies de mariposas conocidas en Croacia. Respecto a la composición de especies, el monte Poštak es similar a la montaña más cercana bien explorada, el monte Dinara. 16 especies registradas están incluidas en la Lista Roja Croata de mariposas, mientras que 10 figuran en la Lista Roja Europea de mariposas. Se han registrado interesantes especies incluyendo *Parnasius apollo*, *Aricia anteros*, *Aricia eumedon*, *Cupido osiris*, *Coenonympha rhodopensis* y algunas otras. Teniendo en cuenta el alto número de especies, así como poblaciones importantes de especies raras, situan al monte Poštak, como uno de los puntos álgidos de diversidad de mariposas en Croacia.
PALABRAS CLAVE: Lepidoptera, Rhopalocera, faunística, composición específica, distribución, montaña, Croacia.

Introduction

Croatia, with its relatively small size of 56 542 km^2 has, due to its geographic position, a rich flora and fauna in comparison to larger European countries. The main reason for this is the influence of different biogeographic regions, including the Mediterranean part of the country influenced by the Adriatic Sea, the Pannonia lowland in the North East, as well as the Dinaric Arc chain which passes through the middle of the country.

One of the main centers of biodiversity in Croatia is the Dinaric Arc, which stretches from the north-western part, almost diagonal to the south-eastern part of the country. This is a southern European mountain chain, spanning through Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia and Albania. It extends for 645 kilometers along the coast of the Adriatic Sea (northwest-southeast), from the Julian Alps in the northwest, down to the Šar-Korab massif in the south. The Dinarides contain a mosaic of Alpine, Continental and Mediterranean species and habitats (TVRTKOVIĆ & VEEN, 2006). The geology of the Dinaric Arc mostly consists of carbonate rocks (limestone and dolomite) with islands of clastic rocks and flysch rocks (GOTTSTEIN MATOČEC, 2002). One of the characteristics of the Dinaric Arc is that it is influenced both by Mediterranean and Continental climates (TVRTKOVIĆ & VEEN, 2006). In Croatia there are no mountains higher than 2000 m a.s.l., with Sinjal on Mt. Dinara with its 1831 m a.s.l. being the highest peak in the country. Nevertheless, there are more than 20 mountains that are higher than 1000 m a.s.l. in Croatia.

Only a few mountains belonging to the Dinarides have been systematically explored in regards to the butterfly fauna, including Učka, Velebit, Dinara, Kamešnica and Biokovo (MIHOCI *et al.,* 2011), which are the tallest and presumably most important mountains in terms of the higher number of species in respect to the higher altitude span. They are also fairly accessible, with lots of marked hiker paths, even some macadam roads, whereas some smaller ones do not have a single marked hiking trail. The mountains on which there was a war zone during the Croatian war for independence are especially problematic due to the presence of minefields, a lot of them still unmarked (either on maps or by sign posts) so even if there are hiker paths on them, it is still a fairly risky endeavour to conduct research.

In this study we present the first systematic data about the butterfly fauna recorded for Mt. Poštak, a mountain located at the border of two regions, continental Lika and Mediterranean Dalmatia. This mountain was never systematically visited in the past, and only few published records exist (KOREN, 2012). Due to its position we expected that: i) the butterfly fauna would be similar to the one present on Mts. Dinara and Velebit, and ii) that the mountain is high enough to support populations of mountainous species.

Materials and methods

Study area

Poštak hill (1425m) also known as "Kučina kosa" is the southernmost outgrowth of Lička Plješivica Mountains, part of the Dinaric Alps near the Bosnia and Herzegovina border. Situated between Velebit Mountains and Dinara Mountains, it shows typical Mediterranean climate and vegetation. Poštak is almost entirely covered with wide meadows mixed with coniferous forests and many karst phenomena, like karst cliffs positioned on the west side of the hill. In contrast its bare peak is the result of wind erosion. Below this isolated hill there is a source of the Zrmanja river which flows into Novigradsko more (Novigrad sea), a gulf on the Adriatic Sea. Because of its position and climate, Poštak is attractive for both hikers and researchers, offering many sights with rich fauna and flora (POLJAK, 2007). One of the herpetological attraction is the lowest finding of Vipera ursinii, at 970m a.s.l. (JELIĆ *et al*., 2013). Other peaks in the surrounding area of Mt. Poštak are Dinara or Sinjal peak (1831m) which is also the highest mountain in Croatia, Bijeli vrh (1369 m) and Brezovac the mountain hut (1050 m) near Suho polje peak (810 m). Total area size of Poštak peak is approximately 480.000 m^2 or about 7 km^2 along with the surrounding area.

In the past, the area of Mt. Poštak has been used mainly for grazing. The inhabitants of the Lika region had the right to use the area of Mt. Poštak and nearby mountains for the grazing of 25 000 sheep during the summer months (VUKELIĆ, 2002). This strongly influenced the area of Poštak, where even today, when there is no grazing, the meadows are still open, and only slight signs of succession can be seen at most localities.

DATA COLLECTION

The data about the butterfly fauna was collected at 11 localities across Poštak, from the base to the top of the mountain. The sampling was carried on during several research visits, including 8 field days during different seasons, ranging from May to September. The list of localities, habitat types, coordinates, altitudes and dates of visits is given in Table I.

Table I.– List of surveyed localities including the name, short habitat description, coordinates, altitude and dates of visits.

	Locality	**Habitat description**	**N**	**E**	**Altitude (m a.s.l.)**	**Dates of visit**
1.	Sučevići	karstic grassland	44.25285	16.060833	650-700	28-VI-2013, 15-VII-2013
2.	Sučevića tavani	karstic grassland	44.257556	16.064151	650-780	23-V-2010, 28-VI-2013.
3.	Brijegovi	grasslands	44.257861	16.079784	750-900	22-VI-2013, 15-VII-2013
4.	Kamenita glava	above the forest edge, near the road; karstic grasslands, bushy areas	44.259005	16.089198	900-1000	23-V-2010, 22-VI-2013
5.	Kirin Vrh	karstic grassland, edge on a slope	44.269481	16.093155	990-1020	28-VI-2013, 28-VI-2013
6.	Ljubina Poljana	grassland near the forest edge	44.261158	16.103383	10001100	23-V-2010, 13-VIII-2010, 9-VIII-2012, 22-VI-2013, 16-VII-2013
7.	Ljubina Poljana, the eastern part	forest edge, meadow	44.261435	16.109845	1100	28-VI-2013, 16-VII-2013
8.	Repino Brdo, above the quarry, below the forest edge	grasslands, and forest edge, with bushy vegetation	44.256081	16.100903	1100–1250	23-V-2010, 13-VIII-2010, 22-VI-2013, 16-VII-2013
9.	from the forest edge to the Poštak peak	*Fagus sylvatica* forest, mountain grassland	44.253991	16.109463	1250-1425	23-V-2010, 13-VIII-2010, 15-IX-2010, 22-VI-2013
10.	between Cvijanovićeva strana and Cvijanovićeva dolina	forest path	44.238019	16.162156	1080	28-VI-2013
11.	Malinjak	forest path, forest clearing	44.248386	16.157018	1190	28-VI-2013

Butterflies were collected by the classical method with entomological nets. Most butterfly species were identified directly in the field using a standard identification key (TOLMAN & LEWINGTON, 2008). Species which could not be identified in the field on the basis of external morphological characteristics were sacrificed, and identified on the basis of the morphology of their genitalia in the laboratory. This applied mainly to the genera *Leptidea*, *Melitaea* and *Hipparchia*.

The genitals were prepared using the procedure described by CLARKE (1941). Initially, we removed the abdomen, with the breaking point between the meso- and metathorax. The removed abdomen was put into a test tube and a few drops of 10% KOH was added. The abdomen was left for 24 hours in the solution, in which all non sclerotized parts dissolved, transferred onto microscope slides and cleaned so only the genitals remain. Genitals were then identified and stored in glycerol. The identification was carried out using determination key, HIGGINS (1975).

For the comparison of studied areas with the surrounding mountains we used the Ward method that joins clusters in such a way that within-group variance is minimized and produces the best results when the Euclidean distance measure is chosen (KOŠMELJ & ŽAUCER, 2006; HAMMER, 2002). The analysis was performed using the program Palaeontological Statistics 2.16 (HAMMER *et al*., 2001). We included the data from the species composition of Mt. Poštak (this study) and surrounding mountains (Dinara, Velebit and Biokovo) (TVRTKOVIĆ *et al*., 2012; MIHOCI *et al*., 2007; MIHOCI *et al*., 2011).

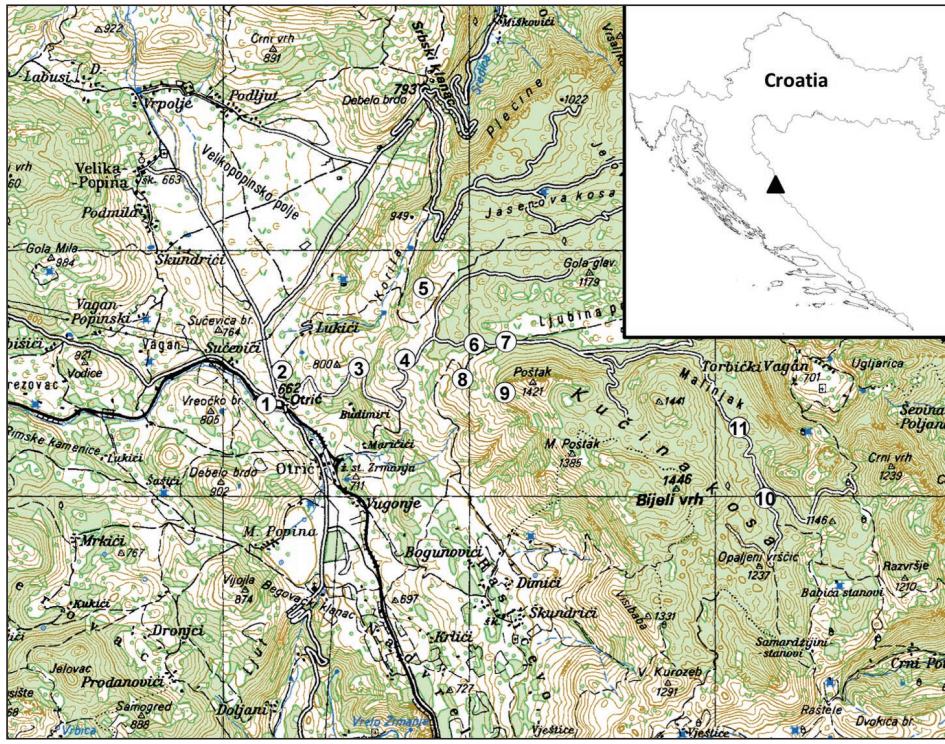

Figure 1.– Map of the surveyed area on Mt. Poštak along with the position of Mt. Poštak in Croatia (black triangle). The numbers of localities correspond to the numbers given in the Materials and methods section.

Results

During this survey a total of 108 butterfly species were recorded, representing 55% of all known butterfly species in Croatia. The systematic list of recorded species, along with the localities on which they were recorded is presented in Tab. II. The cluster joining revealed that Mt. Poštak is most similar to Mt. Dinara, and that these two mountains group together (Fig. 2). The closest to them was Mt. Velebit, and the most different was the Mediterranean mountain Biokovo. The number of species per locality varied between 5 and 72. The highest number of species was recorded in locality 9, from the forest edge to the Poštak peak. The number of recorded species per locality was as follows 1 (35), 2 (35), 3 (33), 4 (28), 5 (69), 6 (67), 7 (41), 8 (5), 9 (72), 10 (9), 11 (33). The two localities with the lowest number of species were 8 and 10, which were small forest clearings.

Discussion

The cluster analysis confirmed that Mt. Dinara and Mt. Poštak are most similar in regards to the butterfly species composition in comparison with all the other sufficiently surveyed mountains belonging to the Dinaric Arc in Croatia (Fig. 2). The biggest difference between these two mountains is the altitudinal difference of about 400 m in favor of Mt. Dinara (highest peak Sinjal, 1831 m a.s.l.). While several species of the genus *Erebia* occur on Mt. Dinara, none of them were recorded on Mt.

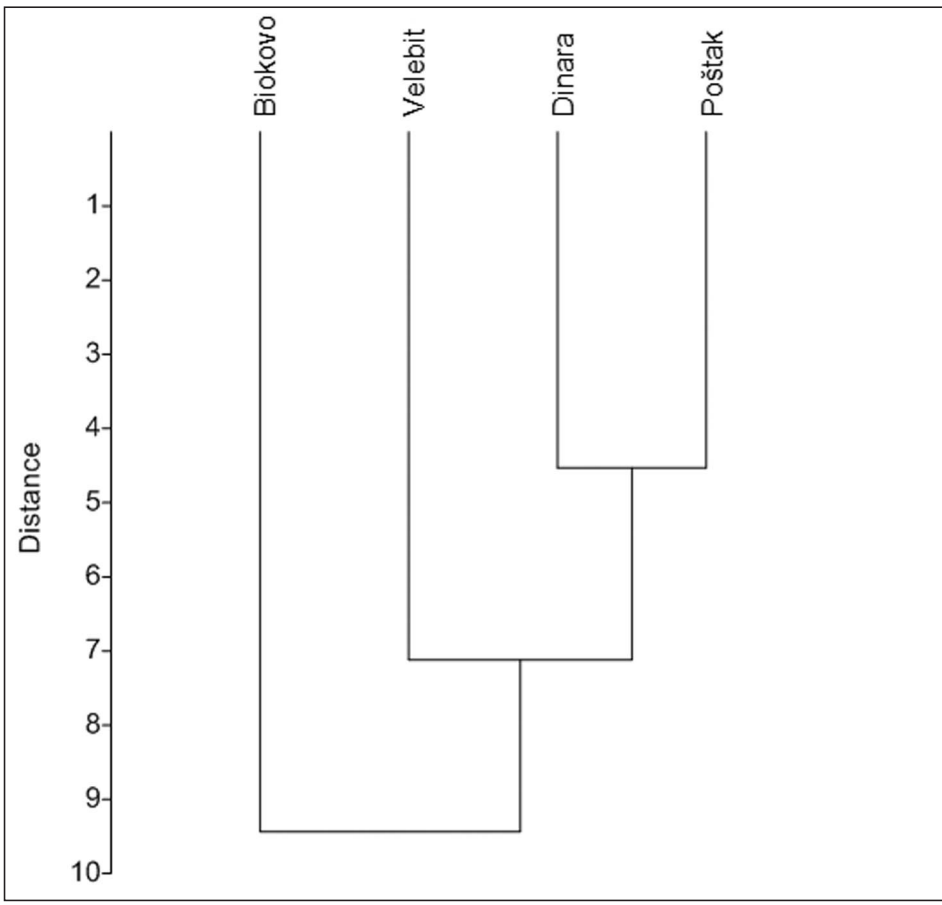

Figure 2.– The cluster analysis of similarity between Mt. Poštak and better surveyed mountains of the Dinaric arc.

Poštak (with the exception of *Erebia medusa* ([Dennis & Schiffermüller], 1775). This could be explained due to limited species migratory potential and microhabitat preferences, due to which most of the *Erebia* species are rather locally distribiuted in Croatia (LORKOVIĆ, 2009). In addition to that, on Mt. Dinara there are many more different habitat types, which results in a higher species count.

The lower part of Mt. Poštak, from the main road up to the first forests (at about 800 m a.s.l.), is a typical, dry karst area, without forest vegetation, with dry grasslands containing almost exclusively very low vegetation. This makes this area highly exposed to the winds that frequently blow here, the main reason why several windmill power plants were built across the area. We were able to collect butterflies in this lower part of the mountain only in June and July, as after those months the area becomes extremely dry and is unsuitable for most butterfly species. One of rare exceptions is *A. arethusa*, which thrives in large numbers on such karst habitat. This species is locally distributed in southern Croatia and rare (JAKŠIĆ, 1988), but is present on some karst mountains (e.g. Dinara, Kamešnica: TVRTKOVIĆ *et al*., 2012). From the first forests (at 800 m a.s.l.) to the peaks of the

Table II.– Systematic checklist of butterfly species recorded on Mt. Poštak. *DD-Data Deficient, VU - Vulnerable, NT - Near Threatened.

Species	**Localities**	**Croatian Red List***
HESPERIIDAE		
Erynnis tages (Linnaeus, 1758)	11	
Carcharodus alceae (Esper, 1780)	9	
Spialia orbifer (Hübner, [1823])	1, 2, 9, 11	
Pyrgus armoricanus (Oberthür, 1910)	6, 8, 9	
Pyrgus malvae (Linnaeus, 1758)	3, 4, 7, 9	
Pyrgus serratulae (Rambur, 1839)	7	
Pyrgus alveus (Hübner, [1803])	7, 11	
Pyrgus carthami (Hübner, [1813])	8	
Pyrgus sidae (Esper, 1784)	9	
Thymelicus lineola (Ochsenheimer, 1808)	1, 2, 3, 4, 5, 6, 9	
Thymelicus sylvestris (Poda, 1761)	3, 6	
Thymelicus acteon (Rottemburg, 1775)	6, 7, 9	DD
Hesperia comma (Linnaeus, 1758)	6, 11	
Ochlodes sylvanus (Esper, 1777)	1, 4, 5, 6, 7, 9, 10	
PAPILIONIDAE		
Parnassius mnemosyne (Linnaeus, 1758)	6, 7, 9, 11	NT
Parnassius apollo (Linnaeus, 1758)	9, 11	VU
Iphiclides podalirius (Linnaeus, 1758)	2, 3, 4, 7, 9, 11	
Papilio machaon (Linnaeus, 1758)	1, 9, 11	NT
PIERIDAE		
Leptidea sinapis (Linnaeus, 1758)	1, 3, 6, 9	
Anthocharis cardamines (Linnaeus, 1758)	11	
Aporia crataegi (Linnaeus, 1758)	1, 2, 3, 4, 5, 6, 7, 9, 11	
Pieris brassicae (Linnaeus, 1758)	2, 6, 7, 9, 11	DD
Pieris mannii (Mayer, 1851)	1, 2, 4, 6, 7, 9	
Pieris rapae (Linnaeus, 1758)	1, 2, 3, 6, 7, 9	
Pieris ergane (Geyer, [1828])	2, 4, 6, 9, 11	
Pieris napi (Linnaeus, 1758)	1, 5, 6, 7, 8, 10	
Pieris balcana (Lorković, 1970)	7, 11	
Pontia edusa (Fabricius, 1777)	1, 2, 4, 6, 9	
Colias crocea (Geoffroy, 1785)	1, 2, 3, 6, 9, 11	
Gonepteryx rhamni (Linnaeus, 1758)	1, 2, 3, 4, 6, 7, 9, 11	
RIODINIDAE		
Hamearis lucina (Linnaeus, 1758)	6, 9	
LYCAENIDAE		
Lycaena phlaeas (Linnaeus, 1761)	6, 7, 9	
Lycaena virgaureae (Linnaeus, 1758)	6, 7	
Lycaena tityrus (Poda, 1761)	6	
Lycaena alciphron (Rottemburg, 1775)	6	
Lycaena candens (Herrich-Schäffer, 1844)	6, 7	
Callophrys rubi (Linnaeus, 1758)	6, 7, 9, 11	
Satyrum spini ([Denis & Schiffermüller], 1775)	4, 9	
Satyrium ilicis (Esper, 1779)	3, 4, 5, 9	
Satyrium acaciae (Fabricius, 1787)	9	
*Cupido minimus (*Fuessly, 1775)	4, 6, 9	
Cupido osiris (Meigen, 1829)	9	
Celastrina argiolus (Linnaeus, 1758)	3, 6, 9	

Pseudophilotes vicrama (Moore, 1865)	2, 3, 5, 6, 11	NT
Scolitantides orion (Pallas, 1771)	4, 11	NT
Glaucopsyche alexis (Poda, 1761)	11	NT
Phengaris arion (Linnaeus, 1758)	3, 6, 9	VU
Phengaris alcon ([Denis & Schiffermüller], 1775)	6	VU
Plebejus argus (Linnaeus, 1758)	3, 4, 6, 9, 11	
Plebejus idas (Linnaeus, 1761)	4	
Aricia eumedon (Esper, 1780)	4, 6, 11	
Aricia agestis ([Denis & Schiffermüller], 1775)	1, 3, 4, 6, 9	
Aricia artaxerxes (Fabricius, 1793)	6, 7	
Aricia anteros (Freyer, 1838)	4, 6, 9, 11	
Cyaniris semiargus (Rottemburg, 1775)	1, 4, 5, 6, 7, 9	
Polyommatus escheri (Hübner, [1823])	9	
Polyommatus dorylas ([Dennis & Schiffermüller], 1775)	4, 9	
Polyommatus amandus (Schneider, 1792)	2, 3, 5, 6, 7, 9, 10	
Polyommatus thersites (Cantener, 1835)	2, 6, 9, 11	NT
Polyommatus icarus (Rottemburg, 1775)	1, 2, 3, 4, 5, 6, 7, 9	
Polyommatus bellargus (Rottemburg, 1775)	1, 2, 3, 4, 6, 9, 11	
Polyommatus coridon (Poda, 1761)	6, 9, 11	
Polyommatus admetus (Esper, 1785)	6	
Polyommatus ripartii (Freyer, 1830)	6	
Polyommatus damon ([Denis & Schiffermüller], 1775)	6, 9	VU
NYMPHALIDAE		
Libythea celtis (Laicharting, 1782)	11	
Argynnis paphia (Linnaeus, 1758)	2, 6, 9	
Argynnis pandora ([Denis & Schiffermüller], 1775)	1, 2, 8	
Argynnis aglaja (Linnaeus, 1758)	1, 3, 6, 7, 9	
Argynnis adippe ([Denis & Schiffermüller], 1775)	2, 9	
Argynnis niobe (Linnaeus, 1758)	9	
Issoria lathonia (Linnaeus 1758)	1, 2, 3, 4, 6, 7, 9, 11	
Brenthis daphne (Bergsträsser, 1780)	1, 2, 3, 5, 6, 7, 9	
Brenthis hecate ([Denis & Schiffermüller], 1775)	1, 2, 3, 4, 5, 6, 7, 9, 10	
Boloria euphrosyne (Linnaeus, 1758)	6, 7	
Boloria dia (Linnaeus, 1767)	1, 6, 9	
Vanessa atalanta (Linnaeus, 1758)	4, 6	
Vanessa cardui (Linnaeus, 1758)	1, 2, 3, 4, 6, 7, 9	
Aglais io (Linnaeus, 1758)	4, 9	
Aglais urticae (Linnaeus, 1758)	6, 11	
Polygonia c-album (Linnaeus, 1758)	6, 9	
Nymphalis polychloros (Linnaeus, 1758)	3, 9	
Euphydryas aurinia (Rottemburg, 1775)	4, 9	NT
Melitaea cinxia (Linnaeus, 1758)	1, 4, 6, 7, 9	
Melitaea phoebe ([Denis & Schiffermüller], 1775)	1, 2, 4, 6, 7	
Melitaea trivia ([Denis & Schiffermüller], 1775)	1, 2, 4, 9	
Melitaea didyma (Esper, 1778)	1, 2, 3, 4, 7, 9	
Melitaea diamina (Lang, 1789)	7	
Melitaea aurelia (Nickerl, 1850)	6, 8	DD
Melitaea athalia (Rottemburg, 1775)	1, 2, 6, 10	
Limenitis reducta (Staudinger, 1901)	4, 7	
Lasiommata megera (Linnaeus, 1767)	1, 2, 3, 4, 5, 6, 8, 9	
Lasiommata maera (Linnaeus, 1758)	2, 7, 8, 10	
Coenonympha rhodopensis Elwes, 1900	2, 6, 9, 11	
Coenonympha arcania (Linnaeus, 1761)	1, 4, 5, 7, 9, 10	

Coenonympha glycerion (Borkhausen, 1788)	1, 2, 4, 5, 6, 7, 9	
Coenonympha pamphilus (Linnaeus, 1758)	2, 3, 4, 6, 9	
Maniola jurtina (Linnaeus, 1758)	6, 7, 9	
Hyponephele lycaon (Kühn, 1774)	9	
Proterebia afra (Fabricius, 1787)	11	NT
Erebia medusa ([Denis & Schiffermüller], 1775)	3, 4, 6, 7, 9, 10, 11	NT
Melanargia galathea (Linnaeus, 1758)	1, 2, 3, 5, 6, 7, 9	
Melanargia larissa (Geyer, [1828])	9	
Satyrus ferula (Fabricius, 1793)	1, 2, 3, 9	
Hipparchia fagi (Scopoli, 1763)	3	
Hipparchia semele (Linnaeus, 1758)	1, 2, 3, 5, 6, 7, 9, 10, 11	
Arethusana arethusa ([Denis & Schiffermüller], 1775)	6, 11	
Brintesia circe (Fabricius, 1775)	1, 3, 6, 9	

mountain, forests are replaced by meadows, making it a more suitable habitat for butterflies. However, frequent strong winds in the area make it difficult to survey, especially from the last forest patches to the peak itself. The best habitats for butterflies in the area are the meadows at Ljubina Poljana, where a total of 68 species was observed. Those meadows are partially sheltered from the wind which is why many species can be observed there. The meadows were probably created when this part of the forest was cut down for timber. This is the reason why these meadows considerably differ from all the other karstic meadows on the mountain and different plant species can survive there in comparison to the other, wind-swept meadows. As we could see from our field trips, as well as from the latest maps of the area, no similar meadows exist on the mountain. There are several small forest patches on the eastern part of the mountain, towards the border with Bosnia and Herzegovina, but they are at best only a few square meters in size. The areas around Poštak peak are probably most prone to winds, and only in two occasions we were able to make a survey of the butterfly fauna of the area. However, all the species that we recorded on the peak itself were already recorded at the lower localities.

Interesting species records

With an altitude of 1425 m, Poštak cannot be considered a high mountain, and one would not expect to find many mountain species on it considering only that fact. However, due to the fact that Mt. Poštak is an intermediate mountain located between higher Mts. Velebit and Dinara, it can be expected that some mountain species occur also on Mt. Poštak. Several such species were recorded during this survey, including *Parnassius apollo* (Linnaeus, 1758)*, Pieris balcana* (Lorković, 1970)*, Aricia eumedon* (Esper, 1780), *Aricia artaxerxes* (Fabricius, 1793), *Aricia anteros* (Freyer, 1838)*, Lycaena candens* (Herrich-Schäffer, 1844) and *Coenonympha rhodopensis* (Elwes, 1900).

During our visit in July we observed only a single individual of *P. apollo* on Mt. Poštak. In the year 2012 M. Zadravec (pers. comm) also observed two individuals flying around the peak. The habitats on the peak of Mt. Poštak do not look like typical habitats for this species in Croatia, so it is possible that the recorded individuals were vagrant specimens from nearby mountains (e.g. from Mt. Troglav; KOREN & LAUŠ, 2013). The fact that we were not able to find any of its larval host plant (*Sedum album*) on Mt. Poštak, further confirms this claim. Aside from *P. apollo*, on Mt. Poštak we recorded a large population of *Parnassius mnemosyne* (Linnaeus, 1758). This species was very common and numerous, especially on the Ljubina Poljana locality.

Probably the most interesting observation during our research on this mountain is a large population of *A. anteros*. This species was recorded from Mt. Poštak only recently (KOREN, 2012), with a single observed specimen in August 2012. However, in the year 2013, it was one of the most numerous lycaenid species in June. It was recorded at different sites, from the approximately 700 m a.s.l. to Poštak peak. At least 50 males were recorded on dry meadows, being most numerous on the clearings just under the last forest patches leading to the peak. Bearing in mind the fact that only

several records, as well as specimens, are known from Croatia (LORKOVIĆ, 2009; KOREN, 2012) until now, this record is extremely important as it seems that Mt. Poštak represent a very suitable habitat for this species.

While the records of the interesting species of genus *Aricia*, *A. anteros* and *A. artaxerxes* on Mt. Poštak were discussed in detailed in KOREN (2012), here we present another record of this genus, *A. eumedon*. Several individuals of this local species were recorded on the mountain. As the other two mentioned species of the genus, *A. eumedon* is also locally distributed and relatively rare in Croatia, so further systematic surveys of the Dinaric Arc are needed. The closest known population is the one known from Mt. Kamešnica (SIJARIĆ, 1977), but we presume that the species occurs also on other, nearby mountains.

During our survey we observed also another interesting lycaenid species, *Cupido osiris* (Meigen, 1829). This species is very locally distributed in Croatia and rare (LORKOVIĆ, 2009). The only recent record originates from Mt. Dinara (TVRTKOVIĆ *et al*., 2010). Literature records of this species in Croatia are also very scarce. Hafner (1994) mentions it for Knin, while HABELER (1976) recorded it in Podgora, near Makarska. This species reaches its north-western distribution point at Kraški Rob, in Slovenia (VEROVNIK, 2011). Between Kraški Rob, and known records from Croatia, there is a large distribution gap, so it is possible that this species will be recorded on other mountains in the Dinaric Arc in the future. As it is very similar to the smaller, *C. minimus,* it can be very easily overlooked during surveys.

Two species of the genus *Phengaris* were recorded, *Phengaris arion* (Linnaeus, 1758) and *Phengaris alcon* ([Denis & Schiffermüller], 1775). These myrmecophilus species are locally distributed and rare in most parts of the country (LORKOVIĆ, 2009). Both species are already known from both Mt. Velebit and Mt. Dinara (MIHOCI *et al*., 2007; TVRTKOVIĆ *et al*., 2012).

On Mt. Poštak we recorded all three species of brown *Polyommatus* blues; *Polyommatus admetus* (Esper, 1785), *Polyommatus ripartii* (Freyer, 1830) and *Polyommatus damon* ([Denis & Schiffermüller], 1775). The only locality where all three species were recorded in Croatia was the spring of the river Zrmanja (KOREN *et al*., 2011), which is located just below the mountain. All three species were recorded at the upper part of the mountain, above 1000 m a.s.l., while the Zrmanja spring is located on 300 m a.s.l.. We did not record any of these species at the intermediate altitudes, so it is uncertain if the two localities are connected. Further survey of more localities on Mt. Poštak, as well as the surrounding peaks could reveal new populations of these species. All three species are locally distributed and rare in Croatia (e.g. MIHOCI *et al*., 2006), with only a limited number of records.

Another mountain species worthy of note is *C. rhodopensis*. This species was observed in large numbers from about 700 m a.s.l. m to the peak itself, which is the lowest known population in Croatia. On Mt. Poštak, as well as on nearby mountain Velebit (LORKOVIĆ, 2009) it is represented by ssp. *occupata* Rebel, 1903.

Regarding the Hesperiidae family fauna, it is interesting to note that all the species of the genus *Pyrgus* known from Croatia (with the exception of the newly discovered *Pyrgus malvoides* (Elwes & Edwards, 1897; KOREN *et al*., 2013), occur on Mt. Poštak. This includes the records of rare and localized species such as *Pyrgus carthami* (Hübner, [1813]), *Pyrgus serratulae* (Rambur, 1839), *Pyrgus sidae* (Esper, 1784) and *Pyrgus alveus* (Hübner, [1803]).

Threatened species

From the 108 recorded species, 16 of them are listed in the Red List of butterflies of Croatia, four species are listed as Vulnerable, three are listed as Data Deficit and nine species are listed as Near Threatened (ŠAŠIĆ & KUČINIĆ, 2004). Out of 108 species recorded on Poštak mountain 10 are listed in the European Red List of Butterflies (VAN SWAAY *et al*., 2010). These species are *Thymelicus acteon* (NT), *Parnassius mnemosyne* (NT), *Parnassius apollo* (NT), *Pseudophilotes vicrama* (NT), *Phengaris arion* (EN), *Aricia anteros* (NT), *Polyommatus dorylas* (NT), *Polyommatus damon* (NT), *Melitaea aurelia* (NT) and *Hipparchia fagi* (NT).

Conclusions

The presence of several threatened species, as well as some local and rare species; lists Mt. Poštak as one of the hotspots of butterfly diversity in Croatia. Regarding that fact, it is to be expected that also other mountains in Dinaric region of Croatia hide a similar or even larger species diversity, which only needs to be discovered in the future.

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